CLAIMS

What is claimed is:

1. A method of purifying an electrolyte comprising:

bringing the electrolyte into contact with a first effective surface of a separating unit that is permeable to contaminants to be removed from the electrolyte;

bringing a purifying liquid into contact with a second effective surface of the separating unit;

maintaining a concentration level of contaminants in the purification liquid which concentration level maintains a contaminant driving force gradient between the electrolyte and the purifying liquid so contaminants transfer from the electrolyte into the purifying liquid.

2. The method of claim 1 comprising maintaining the concentration level of contaminants in the purifying liquid below a preselected concentration.

3. The method of claim 1 comprising maintaining the concentration level of contaminants in the purification liquid substantially constant.

4. The method of claim 1 comprising diluting the purifying liquid during said purifying.

5. The method of claim 1 comprising removing contaminants from the purifying liquid during said purifying.

6. The method of claim 5 wherein said removing contaminants from the purifying liquid comprises chemically binding and precipitating contaminants from the purifying liquid.

7. The method of claim 5 wherein said removing contaminants from the purifying liquid comprises filtering contaminants out of the purifying liquid.

8. The method of claim 5 wherein said removing contaminants from the purifying liquid comprises a method selected from among distillation, membrane distillation, freezing, absorption, and ion exchange.

9. The method of claim 1 comprising moving the electrolyte relative to the first effective surface of the separating unit.

10. The method of claim 1 comprising moving the purifying liquid relative to the second effective surface of the separating unit.

11. The method of claim 9 comprising moving the purifying liquid relative to the second effective surface of the separating unit.

12. The method of claim 11 comprising circulating the electrolyte and the purifying liquid in circuits that are fluidically independent of each other.

13. The method of claim 12 comprising moving the electrolyte and the purifying liquid countercurrently past each other.

14. The method of claim 1 comprising varying at least one intensive variable of state of at least one of the electrolyte and the purifying liquid as a function of the degree of purification desired.

15. The method of claim 14 wherein said intensive variables of state are selected from among temperature and pressure.

16. The method of claim 1 wherein the purifying liquid is selective for specific substances to be removed from the electrolyte.

17. A method of purifying an electrolyte comprising:

bringing the electrolyte into contact with a first effective surface of a separating unit that is permeable to contaminants to be removed from the electrolyte;

bringing a purifying liquid into contact with a second effective surface of the separating unit;

circulating the electrolyte and the purifying liquid in circuits that are fluidically independent of each other;

maintaining a concentration level of contaminants in the purifying liquid below a preselected level to maintain a contaminant driving force gradient between the electrolyte and the purifying liquid so contaminants transfer from the electrolyte into the purifying liquid; and

removing contaminants from the purifying liquid by a method selected from among chemically binding and precipitating contaminants, filtering, distillation, membrane distillation, freezing, absorption, and ion exchange.

18. A method of purifying an electrolyte comprising:

bringing the electrolyte into contact with a first effective surface of a separating unit that is permeable to contaminants to be removed from the electrolyte;

bringing a purifying liquid into contact with a second effective surface of the separating unit;

circulating the electrolyte and the purifying liquid in circuits that are fluidically independent of each other; and

maintaining a concentration level of contaminants in the purifying liquid below a preselected level by in-process dilution to maintain a contaminant driving force gradient between the electrolyte and the purifying liquid so contaminants transfer from the electrolyte into the purifying liquid.

19. The method of claim 18 comprising varying at least one variable selected from among temperature and pressure of at least one of the electrolyte and purifying liquid.

20. An apparatus for purifying an electrolyte comprising:

a first volumetric region for holding the electrolyte;

a second volumetric region for holding a purifying liquid;

a separating unit that is permeable to the contaminants to be removed from the electrolyte and which fluidically separates the first and second volumetric regions.

21. The apparatus of claim 20 wherein the separating unit is porous.

22. The apparatus of claim 21 wherein the separating unit comprises a hollow fiber membrane.

23. The apparatus of claim 22 wherein the hollow fiber membrane consists of a plurality of tubular elements that are arranged next to one another.

24. The apparatus of claim 21 wherein the hollow fiber membrane has a honeycomb structure.

25. The apparatus of claim 20 wherein the separating unit is made to be selective for specific substances.

26. The apparatus of claim 20 wherein permeating mass flow rate can be adjusted as a function of at least one of the effective surface of the membrane and the membrane thickness.

27. The apparatus of claim 20 wherein the walls enclosing the volumetric region for the electrolyte are made of an inert material.

28. The apparatus of claim 20 wherein the volumetric regions are containers.

29. The apparatus of claim 20 wherein at least one of the volumetric regions is fluid communication with a circulation device.

30. The apparatus of claim 29 comprising a flow rate adjuster for said at least one volumetric region in fluid communication with a circulation device.

31. The apparatus of claim 20 comprising a means for adjusting the intensive variables of state of at least one of the electrolyte and the purifying liquid.

32. The apparatus of claim 20 comprising a means for adjusting a parameter of the electrolyte selected from the group of variables comprising temperature and pressure.

33. The apparatus of claim 20 comprising a means for adjusting a parameter of the purifying liquid selected from the group of variable comprising temperature and pressure.

34. The apparatus of claim 20 comprising a decontaminator for separating contaminants from the purifying liquid.

35. The apparatus of claim 34 wherein the decontaminator separates contaminants from the purifying liquid by a method selected from among filtration, distillation, membrane distillation, freezing, absorption, and ion exchange.

36. The apparatus of claim 20 comprising a source of supplemental purifying liquid in communication with the purifying liquid for in-process dilution of the purification liquid to maintain a contaminant concentration level in the purifying liquid so as to maintains a contaminant concentration gradient between the electrolyte and the purifying liquid.